

Trend Study 10R-13-00

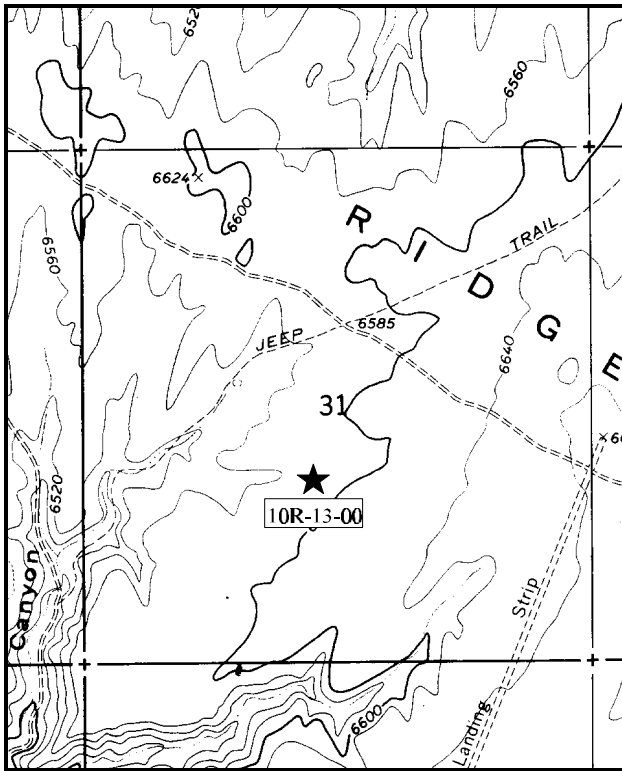
Study site name: Lower McCook Ridge Livestock Exclosure. Range type: Desert Shrub.

Compass bearing: frequency baseline 81°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 71ft), line 2 (34 & 95ft), line 3 (59ft).

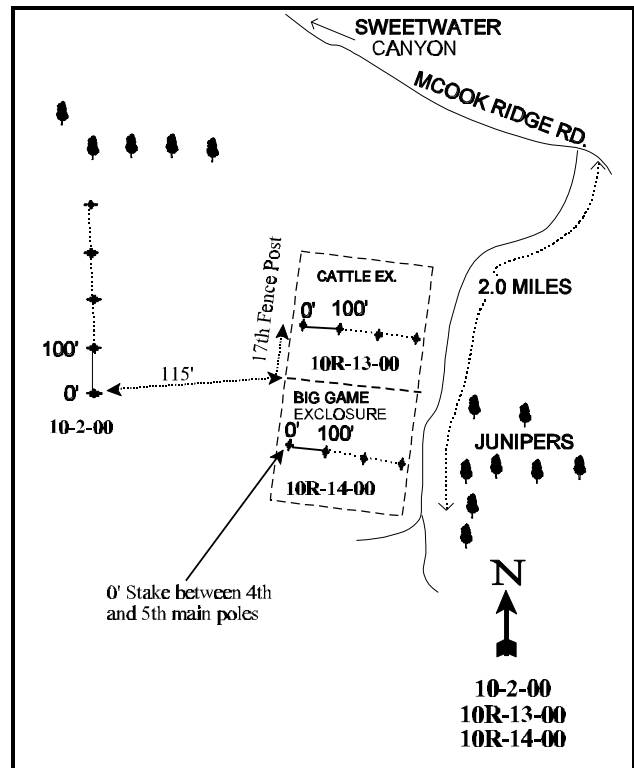
LOCATION DESCRIPTION

From Indian Ridge road, turn southeast and proceed up McCook Ridge approximately 2 miles. A large exclosure can be seen off the south side of the road. From the southwest corner of the livestock exclosure count down 17 fenceposts to the 0-foot baseline stake. The frequency baseline is marked by green fenceposts, 12-18 inches tall.



Map Name: Cooper Canyon.

Township 13S, Range 24E, Section 31



Diagrammatic Sketch

UTM 4389198 N, 647916 E

DISCUSSION

Trend Study No. 10R-13

The Lower McCook Ridge Livestock Enclosure study is located within the Lower McCook Ridge enclosure complex. The enclosure was constructed in 1964 and is approximately 300 feet by 500 feet. The trend study is located within the livestock enclosure and was established in 1997. The site has a slight southwest aspect and a 2-3% slope with an elevation of 6,600 feet. A pellet group transect in the livestock enclosure estimated 96 elk days use/acre (237 edu/ha) and 59 deer days use/acre (146 ddu/ha) in 1997. Pellet group data from 2000 estimate about the same level of deer use at 64 deer days use/acre (158 ddu/ha), but much lighter elk use at 12 elk days use/acre (30 edu/ha). This much lighter use by elk in 2000 is most likely due to several consecutive mild winters which did not force elk down to this important wintering area.

Vegetation cover is abundant with most being provided aurally by the browse species (72% in both 1997 and 2000). Litter cover was moderate in 1997 (35%) with most contributed by cheatgrass. Cover from litter increased in 2000 to over 51%. Effective rooting depth (see methods) was found to be nearly 15 inches with a majority of the rock (56%) in the soil profile found between 12 and 15 inches below the soil surface. Rock and pavement combined provided just 9% cover in 1997, decreasing to less than 4% in 2000. Percent bare ground represented 21% and 27% cover respectively in 1997 and 2000. There are some signs of past soil movement. However, at the present, erosion is not severe. Cryptogam cover is low and found mostly underneath the shrub crowns. Average soil temperature is 61°F at nearly 20 inches in depth.

There are several important browse species on this site including: basin big sagebrush, fourwing saltbush, and winterfat. Sagebrush on the site has characteristics of both basin big sagebrush (*Artemisia tridentata tridentata*) and Wyoming big sagebrush (*Artemisia tridentata wyomingensis*). Identification was difficult due to the high level of hybridization, as a result, all sagebrush were classified as basin big sagebrush. Sagebrush is the dominant browse species and was estimated at 5,780 plants/acre in 1997, and 6,900 plants/acre in 2000. These plants average nearly two feet in height with a two foot crown. Sagebrush cover was estimated at nearly 22% in 2000. Over half of the population showed moderate to heavy use in both 1997 and 2000. Heavy use was estimated at 25% in 1997, increasing slightly to 30% in 2000. This level of use coupled with the smaller growth form is more indicative of Wyoming big sagebrush than basin big sagebrush. Percent decadency was quite low at 10% in 1997, but increased to 31% in 2000. The proportion of decadent plants classified as dying is currently low at 10%. Young recruitment is moderate at 14% in 2000, which is adequate to replace any individuals lost to die-off. The dead to live ratio is 1:13 which is acceptable for a moderately long lived species.

Fourwing saltbush provides just over 16% of the browse cover in 1997 and 2000. It has a relatively high density for fourwing saltbush at 1,100 plants/acre in 2000. This is an overly mature population with high decadency in both sampled years (over 60%). Use is mostly light to moderate with only 13% showing heavy use in 2000. Fourwing was noted as having very few seed stalks in both 1997 and 2000. Recruitment and reproductive potential (number of seedlings) are currently ('00) zero with no young or seedlings being sampled. Winterfat has a moderate density estimated of 5,920 plants/acre in 2000. Winterfat has a mostly mature population with low percent decadency (14%). Although percent decadency is relatively low, this is an increase from 3% in 1997. Currently, recruitment is low at 2%. Use is mostly light to moderate with good vigor on all but 3% of the population. Mature winterfat plants average only eight inches in height with an eight inch crown.

Other browse present on the site are fringed sagebrush, broom snakeweed, and cactus. Fringed sagebrush had an estimated density of 6,260 plants/acre in 1997, this slightly increased to 6,500 plants/acre in 2000. This species could increase in the future if the estimated 10,620 seedlings/acre sampled in 2000 are able to persist and mature. Use on fringed sagebrush is mostly light at this particular site, although on some ranges it is considered important fall, winter, and spring forage.

Cheatgrass appears in scattered dense patches throughout the area with other interspaces between the basin big sagebrush being bare. Cheatgrass is the dominant herbaceous species which provides 65% of the herbaceous cover and 18% of the total vegetative cover in 1997. Due to the drought in 2000, cheatgrass decreased in frequency and cover and currently makes up only 36% of the herbaceous cover or 10% of the total vegetative cover. However, even with this significant decrease, cheatgrass is still the single most abundant herbaceous species. Perennial grasses are few and consist of thickspike wheatgrass, Indian ricegrass, Sandberg bluegrass, and bottlebrush squirreltail. As a group, perennial grasses provide more cover than cheatgrass. All of these perennial species remained at stable frequencies in 2000 with the exception of squirreltail which significantly increased. Grasses had not been utilized when the site was read in June 2000.

Forbs contribute very little to the herbaceous understory with scarlet globemallow providing the most cover. Two annual species were encountered, annual stickseed and tumble mustard, but neither are abundant. All forbs combined provide less than 1% cover.

1997 APPARENT TREND ASSESSMENT

Soils are alluvially deposited and loamy in texture, with some rock and pavement on the surface (<10%). There are signs of past soil movement, yet erosion is not severe at this time. Vegetation and litter cover values are high enough to protect the soil from most wind and water erosion events. Pellet groups were abundant with an estimated 96 elk days use/acre and 59 deer days use/acre. Basin big sagebrush is moderately utilized and appears to have a good age structure. The basin big sagebrush shows more utilization than winterfat, probably due to its availability during periods of snow cover. Winterfat is only lightly hedged with a predominately mature age structure and very low biotic potential this year. Fourwing saltbush is light to moderately hedged with 61% of the population reported as decadent. Mature plants are relatively large (2½ feet by a 3 foot crown) with 16% of the fourwing saltbush population classified as dying. The herbaceous understory is dominated by cheatgrass. Cheatgrass is scattered throughout the site in dense patches, leaving few areas where perennial species may be able to withstand cheatgrass competition. The thickspike wheatgrass plants are small statured, usually containing only one culm with one or two leaves. Sandberg bluegrass appeared in small clumps with good vigor. Forbs are nearly nonexistent on this site. The herbaceous understory could be used as an indicator of trend in the future.

2000 TREND ASSESSMENT

Trend for soil is fairly stable. Average cover of vegetation and litter both increased and should counter the slight increase in bare soil. Sum of nested frequency for perennial herbaceous species increased in 2000 as well, which is a positive factor for holding soils in place. Trend for browse is stable. The key species, most likely a hybrid between basin big sagebrush and Wyoming big sagebrush, has shown a slight increase in heavy use and percent decadence has increased from 10% to 30%. However, vigor remains good and young recruitment is more than adequate to maintain the population. Trend for the herbaceous understory is slightly up as perennial species increased in sum of nested frequency and cheatgrass decreased in frequency due to drought.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --
Herd unit 10R, Study no: 13

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'97	'00	'97	'00	'97	'00
G	Agropyron dasystachyum	18	28	6	8	.49	2.15
G	Bromus tectorum (a)	339	*241	82	68	5.82	4.84
G	Oryzopsis hymenoides	1	1	1	1	.15	.18
G	Poa secunda	131	116	43	42	1.31	2.68
G	Sitanion hystrix	43	*107	19	38	.44	2.74
Total for Annual Grasses		339	241	82	68	5.82	4.84
Total for Perennial Grasses		193	252	69	89	2.40	7.75
Total for Grasses		532	493	151	157	8.22	12.59
F	Arabis spp.	2	-	1	-	.00	-
F	Castilleja spp.	-	*6	-	3	.03	.01
F	Descurainia pinnata (a)	23	*3	14	1	.07	.00
F	Erigeron spp.	12	*-	6	-	.05	-
F	Erigeron pumilus	13	*42	6	18	.09	.22
F	Lappula occidentalis (a)	8	6	5	2	.02	.03
F	Phlox longifolia	-	1	-	1	-	.00
F	Schoenocrambe linifolia	19	*-	9	-	.04	-
F	Sphaeralcea coccinea	57	63	22	22	.41	.53
F	Tragopogon dubius	-	*17	-	7	-	.08
Total for Annual Forbs		31	9	19	3	0.09	0.03
Total for Perennial Forbs		103	129	44	51	0.63	0.85
Total for Forbs		134	138	63	54	0.73	0.89

* Indicates significant difference at % = 0.10

BROWSE TRENDS --

Herd unit 10R, Study no: 13

T y p e	Species	Strip Frequency		Average Cover %	
		'97	'00	'97	'00
B	Artemisia frigida	66	69	2.56	3.62
B	Artemisia tridentata tridentata	75	78	13.35	21.68
B	Atriplex canescens	35	36	3.79	5.64
B	Ceratoides lanata	61	66	3.03	2.51
B	Gutierrezia sarothrae	7	19	.15	.19
B	Opuntia spp.	5	5	.15	.38
B	Sclerocactus	0	1	-	-
Total for Browse		249	274	23.06	34.05

BASIC COVER --

Herd unit 10R, Study no: 13

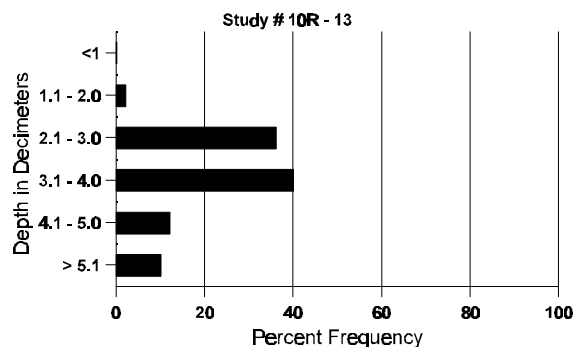
Cover Type	Nested Frequency		Average Cover %	
	'97	'00	'97	'00
Vegetation	408	397	32.47	45.88
Rock	96	54	.75	.20
Pavement	330	258	8.74	3.42
Litter	484	465	35.06	51.30
Cryptogams	219	107	3.60	1.75
Bare Ground	328	350	21.07	27.85

SOIL ANALYSIS DATA --

Herd Unit 10R, Study no: 13

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.6	61.4 (20.0)	6.7	31.0	37.8	31.2	4.98	7.15	153.6	0.65

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 10R, Study no: 13

Type	Quadrat Frequency		Pellet Transect			
			Pellet Groups per Acre		Days Use per Acre (ha)	
	'97	'00	'97	'00	'97	'00
Rabbit	10	12	17	52	N/A	N/A
Elk	18	16	1253	157	96 (238)	12 (30)
Deer	36	41	766	827	59 (145)	64 (158)

BROWSE CHARACTERISTICS --

Herd unit 10R, Study no: 13

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
S	97	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
	00	531	-	-	-	-	-	-	-	-	531	-	-	-	10620			531
Y	97	35	-	-	4	-	-	-	-	-	39	-	-	-	780		39	
	00	19	-	-	-	-	-	-	-	-	19	-	-	-	380			19
M	97	249	-	-	23	-	-	-	-	-	272	-	-	-	5440	13	10	
	00	243	50	-	-	-	-	2	-	-	295	-	-	-	5900	5	8	
D	97	1	1	-	-	-	-	-	-	-	1	-	-	1	40		2	
	00	5	4	2	-	-	-	-	-	-	7	4	-	-	220			11
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'97			.31%			00%			.31%							
		'00			17%			.61%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'97	6260	Dec:	1%			
												'00	6500		3%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Artemisia tridentata tridentata																		
S	97	17	-	-	3	-	-	-	-	-	20	-	-	-	400		20	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	97	62	13	1	15	-	-	-	-	-	91	-	-	-	1820		91	
	00	37	13	-	-	-	-	-	-	-	50	-	-	-	1000		50	
M	97	27	82	59	1	-	-	-	-	-	169	-	-	-	3380	24 29	169	
	00	26	97	47	13	1	4	-	-	-	188	-	-	-	3760	20 26	188	
D	97	8	6	13	-	2	-	-	-	-	19	-	-	10	580		29	
	00	12	26	51	-	15	3	-	-	-	96	-	-	11	2140		107	
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	540		27	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	520		26	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'97		36%			25%			03%			+16%							
'00		44%			30%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'97	5780	Dec:	10%			
												'00	6900		31%			
Atriplex canescens																		
Y	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	97	8	4	2	-	-	-	-	-	-	14	-	-	-	280	30 35	14	
	00	9	9	-	-	-	-	-	-	-	18	-	-	-	360	31 38	18	
D	97	11	11	2	3	-	-	-	-	-	20	-	-	7	540		27	
	00	18	5	3	5	-	4	2	-	-	30	-	-	7	740		37	
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'97		34%			09%			16%			+20%							
'00		25%			13%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'97	880	Dec:	61%			
												'00	1100		67%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Ceratoides lanata																		
S	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	97	12	4	-	3	2	-	-	-	-	21	-	-	-	420		21	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	97	102	75	35	5	2	-	-	-	-	218	-	-	1	4380	10	11	
	00	143	73	5	27	-	-	-	-	-	248	-	-	-	4960	8	8	
D	97	-	2	6	-	-	-	-	-	-	8	-	-	-	160		8	
	00	12	24	2	-	-	3	-	-	-	32	-	-	9	820		41	
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'97		34%			17%			.40%			+16%							
'00		33%			03%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'97	4960	Dec:	3%			
												'00	5920		14%			
Gutierrezia sarothrae																		
S	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	97	15	-	-	-	-	-	-	-	-	15	-	-	-	300	8	8	
	00	39	-	-	-	-	-	-	-	-	39	-	-	-	780	5	7	
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'97		00%			00%			00%			+64%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'97	300	Dec:	-			
												'00	840		-			
Juniperus osteosperma																		
S	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'97		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'97	0	Dec:	-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Opuntia spp.																	
S	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	20		1
Y	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	20		1
M	97	9	-	-	-	-	-	-	-	-	-	9	-	-	180	5 9	9
	00	8	-	-	-	-	-	-	-	-	-	8	-	-	160	3 9	8
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>			
'97		00%				00%				00%				+ 0%			
'00		00%				00%				00%							
Total Plants/Acre (excluding Dead & Seedlings)														'97	180	Dec:	-
														'00	180		-
Sclerocactus																	
M	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	20	- -	1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>			
'97		00%				00%				00%							
'00		00%				00%				00%							
Total Plants/Acre (excluding Dead & Seedlings)														'97	0	Dec:	-
														'00	20		-